

DETAILED ACTION

Claims 1-22 have been canceled.

Election/Restrictions

The Requirement for Restriction dated October 4, 2007 is withdrawn in view of Applicant's amendments to the claims. Accordingly, an action on the merits of all claims 23-38 follows.

Drawings

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "31" (Figs. 1 and 7) has been used to designate both the "controller 31" in Fig. 1 and the "liquid outlet 31" in Fig. 7. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

The drawings are further objected to as failing to comply with 37 CFR 1.84(u) because separate views shown therein are not numbered with Figure numbers. Each of the separate end views shown below FIG. 2, FIG. 4 and FIG. 6, respectively, must be given a Figure number in the drawing, e.g., as FIG. 2A, FIG. 4A and FIG. 6A. Further, the use of two lead lines from **each** reference numeral “14” and “15” pointing to or denoting an element in two separate figures or views is objected to. For example, FIG. 2 and FIG. 2A should **each** show reference numerals “14” and “15” with appropriate lead lines.

Moreover, with the drawings so corrected, reference to each of these separate views must also be made in the specification, e.g., in the “Brief Description of the Drawings” and in the “Description of the Preferred Embodiment.”

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the “**vacuum producing means**” (emphasis added) recited in claims 25, 27, 34 and 35, the “**vacuum container**” (emphasis added) recited in claim 27, and the valve “**actuator**” (emphasis added) recited in claim 30, must be shown or the features canceled from the claims. No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the

drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification Objections

In page 5, line 19, "leass" should be corrected to -- less --.

The statement in the specification bridging pages 5 and 6 that "*Monitor/controller 16 sequences the opening and closing of valve 8, valve 7 and valve 5*" is questioned. First, no "Monitor/controller 16" is shown in any of the figures. Apparently monitor/controller 31 was meant instead. Second, assuming the latter, the specification in the above broad statement fails to comply with 35 U.S.C. 112, first paragraph, in that it does not provide a written description of the invention, and of the manner and process of making and using it, in such full, clear concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same. Again, assuming monitor/controller 31 was meant, or that this is the same controller 31 shown in Fig. 7, it is not clear from either the written description or drawings how this monitor will be able to carry out the **sequential** functions of "opening and closing of valve 8, valve 7 and valve 5" as broadly described. Figure 1 shows controller 31 as being connected to or controlling **only valve 8**. However, there is no showing whatsoever of the controller 31 being connected to either of

valves 5 and 7. If Fig. 7 is meant to be the same as controller 31, then it is not clear from this figure (from the detailed structure shown) how the automatic controller controls valve 8 or even valves 7 and 5 in the desired sequence.

The specification is further objected to in failing to comply with 37 CFR 1.75(d)(1) because the new term **“excavation”** used in new parents claim 23 and 23, in line 1, respectively thereof, do not have clear support or antecedent basis in the specification. Appropriate amendment of the specification in this respect is required in order to insure certainty in construing the claims in the light of the specification. See MPEP § 608.01(o).

The abstract of the disclosure is objected to because it contains legal language, specifically “means” in line 1. Correction is required. See MPEP § 608.01(b).

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim 28 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the **enablement requirement**. Claim 28 contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Specifically, the recitation in claim 28 of **“said processor controller sequencing the opening or closing of said valves, whereby said controller can sequence the filling of said container with said gas and said liquid and sequence the dispensing of said liquid on a repeatable frequency as desired”**

(emphasis added) is not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Again, the broad statement in the specification bridging pages 5 and 6 that “Monitor/controller 16 sequences the opening and closing of valve 8, valve 7 and valve 5” fails to provide an adequate description, nor does the drawing provide a detailed structural showing as to how the monitor/controller can carry out the desired sequential opening and closing of valves 8, 7 and 5. While Figure 1 shows controller 31 connected to or controlling **only valve 8**, there is no showing whatsoever of the controller 31 *being connected to valves 5 and 7* so as to control the sequential opening and closing of these valves, as broadly described. Moreover, if Fig. 7 is meant to be the same as controller 31, then it is not clear from the figure (from the detailed structure shown) how the automatic controller controls valve 8, or even valves 7 and 5 in the desired sequence.

Claims 28, 30 and 36-38, newly added, are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the **written description requirement**. The new claims now in this application contain subject matter that fails to have any support in the **original** disclosure and which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor, at the time the application was filed, had possession of the claimed invention.

In regard to new claim 28, the recitation that the process controller can sequence the dispensing of the liquid “**on a repeatable frequency as desired**” (emphasis added) is considered to be **new matter** not supported by the original disclosure. The original disclosure (the sentence bridging pages 5 and 6 of the specification) only broadly states that the

"Monitor/controller 16 sequences the opening and closing of valve 8, valve 7 and valve 5", and original claim 5 (now canceled), which also is part of the original disclosure, merely broadly recites that the "processor means controls the pressure, fill or discharge." However, there is no teaching, whatsoever, in any of the original disclosure that the "process controller" can sequence the dispensing of the liquid **"on a repeatable frequency as desired"** (emphasis added), as now recited in the last line of new claim 28.

With further respect to new claim 30, the recitations therein of "said valve having an actuator" and "valve actuator" are further considered to be new matter not supported by the original disclosure. While valves controlled by a processor controller usually include an "actuator", neither the specification nor drawings explicitly disclose a valve actuator or actuators.

New dependent claims 36, 37 and 38, as combined with either of their respective parent claims 23 or 25, each define overall new combinations not supported by the **original** disclosure, and therefore are directed to **new matter**. Specifically, the recitations in claim 36 of **"disposing within said liquid of said container a positive electrode and a negative electrode...and further comprising, an electrical current traveling between said negative electrodes and said positive electrode whereby said electrical current dissipates a portion of it's energy into said liquid...thus converting a portion of the liquid into a gaseous phase, thus further increasing the pressure of the gaseous propellant"** (emphasis added), and in each of claims 37 and 38 of **"passing an electrical current through said liquid in said container"** (emphasis added), each involve subject matter directed exclusively to the "third embodiment" described in page 8 of the specification and **Figure 5** of the drawings, whereas parent claims 23 or 25, on which each of dependent claims 36, 37 and 38 depend, are exclusively directed to the first and

second embodiments, disclosed in **Figures 1 and 2**, respectively, each of which require the container to be **“first filled with a gas, and secondly filling said container with a liquid under pressure thus further compressing said gas to a pressure substantially equivalent to that of said liquid”** (emphasis added). There is no basis or support whatsoever in the original disclosure for the new combination recited in each of claims 36, 37 and 38 (i.e., a combination of the separate, exclusive air/gas over water embodiments or species of either Figures 1 or 2, as recited in parent claims 23 or 25, respectively, with that of the separate, exclusive “electrical current” embodiment or species of Figure 5). Accordingly, for the reason given above, each of claims 36, 37 and 38 are directed to **new matter**.

Further, with respect to claim 38, the recitation in the last 3 lines of the claim of **“whereby said process controller may sequence the interaction of said electrical current with said opening or closing of said valves”** (emphasis added), is not supported by the **original** disclosure, and therefore is directed to **new matter**.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 23, 25 and 31 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claims 23 and 25, line 12 of each claim, the recitation of “said orifice and valve,” (referring to a **single** orifice and **single** valve), is inconsistent with prior recitations in each of these claims of “one or more orifices and one or more valves” (referring to the “orifices” and

"valves" in **plural form**). The above-noted inconsistency renders these claims indefinite. These claims, however, may be amended to avoid indefiniteness in this respect, e.g., by correcting the above recitation of "said orifice and valve", in line 12 of each claim, instead to --said one or more orifices and one or more valves-- for consistency and clarity.

In claim 31, line 2, there is no proper antecedent basis for the recitation for the recitation of "said liquid compartment". The claim, however, may be amended to avoid this rejection, e.g., by correcting the above recitation to --a liquid compartment--.

Dependent claims 24 and 26-38 are indefinite for the same reasons as their parent claims 23 and 25 noted above.

Claim Rejections - 35 USC § 102

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 23, 24, 26, 30/23, 31 and 32/23 are rejected under 35 U.S.C. 102(b) as being anticipated by Yie (U.S.P. 6,431,465), newly cited.

With respect to claim 23, Yie '465 discloses a method of excavation wherein dirt or solids are made vacuumable (*col. 10, lines 57-59, wherein Yie discloses "concrete demolition work and in mining/tunneling applications"*) by using a compressed gas (*col. 3, lines 24 and 27; col. 4, line 46; col. 5, line 51, 58, col. 6, line 42*) as a means of force (*col. 6, lines 56-65 and col. 10, lines 38-41*) in order to propel a volume of liquid (*water, col. 6, line 34; col. 10, line 57*) to impact the dirt or solids with the liquid, the method comprising:

a container (*accumulator 5, Fig. 1, col. 3, lines 22-54*) having one or more orifices *10, 13, 14 (Fig. 1)* and one or more valves *11*,

the container *5,6,7 (Fig. 1)* being first filled with a gas (*gas chamber 7*), and

secondly, filling the container *5,6* with a liquid (*water, col. 6, line 34; col. 10, line 57*) under pressure thus further compressing the gas to a pressure substantially equivalent to that of the liquid, and further comprising

opening (*col. 10, lines 56 and 57*) one or more of the valves *11* in order for the gas under pressure to propel the liquid (*water, col. 6, line 34; col. 10, line 57*) through the orifice *13,14* and the valve *11* and further comprising,

the propelled liquid (*water*) being directed to impact the dirt or solids (*col. 10, lines 57-59, wherein Yie discloses "concrete demolition work and in mining/tunneling applications"*).

As to claim 24, Yie '465 discloses providing a diaphragm (*piston 8, Fig. 1*) disposed within the container *5* positioned between the gas and liquid.

With respect to claim 26, Yie '465 discloses positioning a conduit (*Fig. 1, the line or tube, unnumbered, running from the outlet or orifice 10 of container 5 to the inlet of valve 11*) in communication with the valve *11* and orifice *10* whereby the conduit (*unnumbered, Fig. 1*) serves to dispense the liquid (*water*) from the container *5*.

Regarding claim 28/23 (claim 28 what is dependent on claim 23), Yie '465 discloses a process controller *19 (col. 6, lines 20-24 and 60-65)* for sequencing the opening or closing of the valves *4,11 (Fig. 1)*, whereby the controller *19* can sequence the filling of the container *5,7* with

the gas (*air*) and the liquid (*water*) and sequence the dispensing of the liquid (*water*) on a repeatable frequency as desired (*col. 10, lines 60-65*), as called for in this claim.

With respect to claim 30/23 (claim 30 that is dependent on claim 23), Yie '465 discloses valve actuators 15,16 (Fig. 1) for opening or closing the valves 4,11.

Regarding claim 31, Yie '465 discloses a liquid compartment 6 of the container 5 having one or more dispensing orifices 10, 13 (*also multiple nozzle assemblies, col. 10, lines 38-40*)..

With regard to claim 32/23 (claim 32 dependent on claim 23), Yie '465 discloses positioning a first end (*unnumbered, Fig. 1*) of a dispensing conduit (*unnumbered, Fig. 1*) in communication with the container orifice 10 or valve 11, and a second end (*unnumbered; Fig. 1*) of the dispensing conduit having one or more dispensing orifices 13,14.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 25, 27, 28/25, 29, 30/25, 32/25 and 33-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yie '465, as applied above to claims 23, 24, 26, 30/23, 31 and 32/23, in view of Simmons *et al.* (U.S.P. 5,016,717), hereinafter referred to as Simmons.

Independent claim 25 and dependent claim 27 each **differ** from independent claim 23, and from the primary reference to Yie '465, by additionally reciting "*a vacuum conduit...having*

a first end...positioned in communication with said dirt or solids and a second end...being connected to a vacuum producing means" (emphasis added) while claim 27, further recites that the *"second end of the vacuum conduit being attached to a vacuum container and further comprising said vacuum container having a vacuum producing means"* (emphasis added), and claim 35 additionally requires having the **"second end"** of the liquid dispensing conduit to be *"adjacently positioned in communication with said first end of said vacuum conduit"* (emphasis added). Claim 34 distinguishes over Yie '465 in the recitation of the *"second end of said dispensing conduit being positioned adjacent to a first end of a vacuum conduit and further comprising a second end of said vacuum conduit being connected to a vacuum producing means."* (emphasis added).

The secondary reference to Simons (*col. 5, line 62-col. 6, line 56 and Figs. 6-8 and particularly Figs. 9 and 10*), however, discloses a **vacuum excavator** having a **suction system 23**, as specifically called for in claims 25, 28/25, 29, 30/25, 32/25, 34 and 35, comprising a vacuum conduit (*suction hose assembly 127, Figs. 6, 8 and 9*) having a first end (*distal end 138 of rigid hose 136*) positioned in communication with the dirt or solid *151,28 (Fig. 9)* and a second end (*proximate end 129, Figs. 6 and 8*) being connected to a vacuum container (*suction tank 105, Figs. 8, 10*) which is connected to a vacuum producing means (*suction blower 70*), and wherein the "second end" (*lower, nozzle end 65c, Figs. 6 and 9*) of the liquid dispensing conduit 65 is adjacently positioned in communication with the "first end" (*distal end 138 in the excavation opening 151, Fig. 9*) of the vacuum conduit 136.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have combined the suction system and method of Simons, with the high-pressure,

pulsed liquid-jet system and method of Yie, in view of the above teaching in Simons of combining an excavated debris suction system and method with a high-pressure pulsed waterjet system/method of excavation/mining/tunneling, for the purpose of efficiently removing the dislodged earthen particles from the excavation opening while simultaneously carrying out the hydraulic pulse-jetting/excavation steps.

As to claim 28/25 (claim 28 that is dependent on claim 25), Yie '465 discloses a process controller (19, col. 6, lines 20-24, 60-65) for sequencing the opening or closing of the valves 4,11 (*Fig. 1*), whereby the controller 19 can sequence the filling of the container 5,7 with the gas (*air*) and the liquid (*water*) and sequence the dispensing of the liquid (*water*) on a repeatable frequency as desired (col. 10, lines 60-65), as called for in this claim.

With respect to claim 29, Yie '465 discloses providing a diaphragm (*piston 8, Fig. 1*) disposed within the container 5 positioned between the gas and liquid, as required by this claim.

With respect to claim 30/25 (claim 30 that is dependent on claim 25), Yie '465 discloses valve actuators 15,16 (*Fig. 1*) for opening or closing the valves 4,11.

With regard to claim 32/25 (claim 32 dependent on claim 25), Yie '465 discloses positioning a first end (*unnumbered, Fig. 1*) of a dispensing conduit (*unnumbered, Fig. 1*) in communication with the container orifice 10 or valve 11, and a second end (*unnumbered; Fig. 1*) of the dispensing conduit having one or more orifices 13,14.

As to claim 33, Yie '465 discloses positioning the first end (*unnumbered, Fig. 1*) of a dispensing conduit (*unnumbered, Fig. 1*) in communication with the container orifice 10 or dispensing valve 11 and the second end (*unnumbered; Fig. 1*) of the dispensing conduit

(unnumbered; Fig. 1) in communication with the dirt or solid (col. 10, lines 57-59, wherein Yie discloses "concrete demolition work and ...mining/tunneling applications").

Conclusion

An examination of this application reveals that applicant is unfamiliar with patent prosecution procedure. While an inventor may prosecute the application, lack of skill in this field usually acts as a liability in affording the maximum protection for the invention disclosed. Applicant is advised to secure the services of a registered patent attorney or agent to prosecute the application, since the value of a patent is largely dependent upon skilled preparation and prosecution. The Office cannot aid in selecting an attorney or agent.

A listing of registered patent attorneys and agents is available on the USPTO Internet web site <http://www.uspto.gov> in the Site Index under "Attorney and Agent Roster." Applicants may also obtain a list of registered patent attorneys and agents located in their area by writing to the Mail Stop OED, Director of the U. S. Patent and Trademark Office, PO Box 1450, Alexandria, VA 22313-1450

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher J. Novosad whose telephone number is 571-272-6993. The examiner can normally be reached on Monday-Thursday 5:30am-4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Carone can be reached at 571-272-6873. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Christopher J. Novosad/
Primary Examiner, Art Unit 3641

January 8, 2010